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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,744	02/27/2004	Wai Yuen Ho	200207272-1	8419

  

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HEWLETT PACKARD COMPANY		
P O BOX 272400, 3404 E. HARMONY ROAD		
INTELLECTUAL PROPERTY ADMINISTRATION		
FORT COLLINS, CO 80527-2400		

  

EXAMINER	
LIANG, LEONARD S	

  

ART UNIT	PAPER NUMBER
2853	

  

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/789,744

Applicant(s)

HO, WAI YUEN

Examiner

Leonard S. Liang

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-7 and 9-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7 and 9-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

11/24/07  
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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al in view of Floyd (US Pat 3071018).

Ito et al discloses:

- {claim 1} A carriage drive system (figure 1); a variable speed drive motor configured to propel a movable carriage along a slide rod, wherein the movable carriage supports print heads having an ink ejecting nozzle, and wherein the variable speed drive motor is an electric motor (figure 1, references 2, 3A, 3B, and 6; abstract; column 4, lines 44-54)
- {claim 7} A printer (figure 1); a movable carriage supporting print heads having an ink ejecting nozzle (figure 1, reference 2); a slide rod for supporting and guiding the movable carriage (figure 1, reference 3A, 3B); a variable speed drive motor configured to propel the movable carriage along the slide rod (figure 1, reference 6), wherein the variable speed drive motor is an electric motor (column 4, lines 49-50)

- {claim 14} A method of printing (figure 1); comprising activating a variable speed drive motor to propel a movable carriage along a slide rod, wherein the movable carriage supports print heads having an ink ejecting nozzle and wherein the variable speed drive motor is an electric motor (figure 1; abstract; column 4, lines 44-54)

Ito et al differs from the claimed invention in that it does not disclose:

- {claim 1} an electric motor having a gear ratio resulting in a high carriage speed and a gear ratio resulting in a low carriage speed; and a centrifugal clutch operable to switch between the gear ratio resulting in a high carriage speed and the gear ratio resulting in a low carriage speed wherein the centrifugal clutch is an automatic two-way clutch, such that switching between the gear ratio resulting in the high carriage speed to the gear ratio resulting in a low carriage speed and switching between the gear ratio resulting in the low carriage speed to the gear ratio resulting in the high carriage speed both occur automatically based upon the operational speed of the drive motor
- {claim 7} a gearing mechanism having a gear ratio resulting in a high carriage speed and a gear ratio resulting in a low carriage speed; and a centrifugal clutch operable to switch between the gear ratios wherein the centrifugal clutch is an automatic two-way clutch, such that switching between the gear ratio resulting in a high carriage speed to the gear ratio resulting in a low carriage speed and switching between the gear ratio resulting in a low carriage speed to the gear

ratio resulting in a high carriage speed both occur automatically based upon the operational speed of the drive motor

- {claim 14} a motor having a gear ratio resulting in a high carriage speed and a gear ratio resulting in a low carriage speed; switching between the gear ratio resulting in a high carriage speed and the gear ratio resulting in a low carriage speed; wherein switching between the gear ratio resulting in a high carriage speed to the gear ratio resulting in a low carriage speed and switching between the gear ratio resulting in the low carriage speed to the gear ratio resulting in the high carriage speed both occur automatically by means actuated by the operational speed of the drive motor

The limitations not found in Ito are limitations which are characteristic of a motor comprising a two-way clutch.

Floyd discloses a mechanical drive mechanism comprising a two-way universal clutch. Even though Floyd does not disclose that its two-way clutch could be applied in carriage drive printing contexts, the clutch mechanism of Floyd has been known to be used in such contexts. Just as a demonstrative example, Black et al (US Pat 3780652) discloses driving a printing system driving a carriage using the two-way universal clutch of Floyd (column 11, lines 11-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the speed controlling carriage driving motor of Ito et al (which uses energized coils as opposed to gears) with a speed controlling carriage driving motor comprising the two-way clutch mechanism of Floyd. The motivation for the skilled artisan in

doing so is to gain the benefit of cheaper materials, since building a motor comprised of gears may be more economically feasible to some than building a motor comprised of energized coils.

Claims 3-6 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al in view of Floyd (US Pat 3071018), as applied to claims 1, 7, and 14 above, and further in view of Youngren et al (US Pat 2699076).

Ito et al, as modified, teaches all limitations of the claimed invention except for the following:

- {claims 3 and 7} wherein the gearing mechanism is a planetary gear assembly having a sun gear driven by the drive motor; a ring gear; and a plurality of planet gears associated with a planet carrier
- {claims 4 and 10} wherein operation of the drive motor at a high speed causes the centrifugal clutch to engage the ring gear causing the planet gears and the drive gear to be locked together such that they rotate as one with the sun gear resulting in a 1:1 gear ratio and operation of the drive motor at a low speed causes the mechanism/centrifugal clutch for switching between gear ratios to disengage the ring gear causing the sun gear to turn the planet gears which turn the ring gear resulting in a gear ratio greater than 1:1
- {claims 5 and 11} further comprising a speed calibration member for adjusting the gear ratio between the drive motor and the ring gear

- {claims 6 and 12} wherein the gear ratio between the drive motor and the ring gear is proportional to a friction force between the planet carrier and the speed calibration member
- {claim 13} wherein the speed calibration member is manually adjustable

Youngren et al discloses:

- {claims 3 and 7} wherein the gearing mechanism is a planetary gear assembly having a sun gear driven by the drive motor; a ring gear; and a plurality of planet gears associated with a planet carrier (column 3, lines 44-60)
- {claims 4 and 10} wherein operation of the drive motor at a high speed causes the centrifugal clutch to engage the ring gear causing the planet gears and the drive gear to be locked together such that they rotate as one with the sun gear resulting in a 1:1 gear ratio and operation of the drive motor at a low speed causes the mechanism/centrifugal clutch for switching between gear ratios to disengage the ring gear causing the sun gear to turn the planet gears which turn the ring gear resulting in a gear ratio greater than 1:1 (column 4, line 81 – column 5, line 12)
- {claims 5 and 11} further comprising a speed calibration member for adjusting the gear ratio between the drive motor and the ring gear (column 4, line 81 – column 5, line 12)
- {claims 6 and 12} wherein the gear ratio between the drive motor and the ring gear is proportional to a friction force between the planet carrier and the speed calibration member (column 4, line 81 – column 5, line 12)

- {claim 13} wherein the speed calibration member is manually adjustable (column 4, line 81 – column 5, line 12; the disclosure of using a brake in a motor vehicle context translates to using some form of manual adjustment for the clutch in a printing context)

Although the above limitations are not explicitly disclosed by Floyd and Ito et al, they are all statements of natural implications of how a two-way clutch works, as demonstrated by Youngren et al. Although Youngren et al is directed to using a two-way clutch in motor vehicles, its principles carry over to the use of a two-way clutch in a speed-controlling carriage-moving printing system, as demonstrated by Ito et al in view of Floyd, as shown above.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Youngren et al into the invention of modified Ito et al. The motivation for the skilled artisan in doing so is to gain the benefit of proper functionality of the two-way clutch driving mechanism.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 3-7, and 9-14 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Burnett (US Pat 2995954) discloses a power transmitting mechanism.



Teague (US Pat 4343007) discloses a multi-color multi-point recorder.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S. Liang whose telephone number is (571) 272-2148. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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**STEPHEN MEIER**  
**SUPERVISORY PATENT EXAMINER**